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ABSTRACT

In the past 15 years, a number of information literacy models have been developed to describe the skills needed to successfully conduct research and solve information problems. All of these models are useful and share a common framework that the authors have synthesized into eight major categories of information skills, each with a set of sub-skills, sequenced across three broad research stages. The format of this list is not intended to imply a lockstep linear process but, in actuality, represents an iterative process in which any or all skills may be revisited in order to modify or expand on previous ones. The Beginning Stage includes definition, selection, and planning; the During Stage includes exploration, collection, and organization; and the Ending Stage includes presentation and evaluation. Based on what is known from Kuhlthau's research, at the beginning of the research process when students are required to define their research task, select and narrow their research topic, and plan their research strategy, motivational goals should lead to an instructional design that: generates student interest in the research process; helps students recognize the importance of learning information literacy skills; and builds students' confidence in their ability to successfully conduct research tasks. During the research process, as students explore, gather, and organize information, motivational goals should focus on: maintaining students' interest in the research process; promoting continued valuing of learning information literacy skills; and reinforcing students' confidence in their research ability. As students proceed through the concluding stage of the process in which their research results must be presented and evaluated, motivational goals should emphasize encouraging students' ongoing confidence in their research ability; promoting students' satisfaction in their research accomplishments; and motivating students' continuing information exploration. The underlying motivation theories for each of these stages are also specified. (Contains 10 references.) (AEF)

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Motivation Power: Exciting Kids About Research

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Introduction

Information literacy, the ability to find, select, organize, use, manage, evaluate, and present information, is a critical literacy for the 21st century. In a society dominated (and often overwhelmed) by information in a multitude of formats (e.g. video, audio, text, graphics), a major challenge in education is to teach our nation's youth to "be able to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information" (American Library Association, 1989, p.1).

To be information literate is to be "an effective user of ideas and information," according to *Information Power: Building Partnerships for Learning*, the professional guidelines for the school library field (AASL/AECT, p. 6). Education goals on both the national and state levels specify the importance of students' ability to use information to solve problems, make decisions and develop skills for lifelong learning.

Information Literacy Models

In the past 15 years, a number of information literacy models have been developed to describe the skills needed to successfully conduct research and solve information problems. For example, Eisenberg and Berkowitz's Big Six© Approach to Information Problem-Solving (1990) specifies a general approach to the information problem solving process consisting of six major steps. The Big Six Approach begins with defining the parameters of the information task or problem and ends with evaluating both the results of the process and the process itself. Stripling and Pitts' Research Process Model (1988) follows a more linear approach to research, a ten-step process interspersed with eight "reflection points" that allow students to evaluate and revise or repeat completed steps where needed.

Kuhlthau's Model of the Search Process (e.g.1993) uses the results of several years of research to describe the six stages that students undergo during the research process. She found that, rather than a neat and sequential set of skills, it is a learning process that can be somewhat messy and more iterative in nature. She also found that there are both cognitive and affective aspects to the information seeking process. For example, students frequently explore and collect information before they have done an adequate job of formulating and narrowing their topic.

All of these models are useful and share a common framework that we have synthesized into eight major categories of information skills, each with a set of sub-skills, sequenced across three broad research stages (see Fig. 1). The format of this list is not intended to imply a lockstep linear process but, in actuality, represents an iterative process in which any or all skills may be revisited in order to modify or expand on previous ones.

Beginning Stage

Definition

- Identifies requirements of research task.
- Determines amount/type of information needed to complete research task.
- Considers potential topics.

Selection

- Narrows topic to be explored.
- Specifies subtopics or related keywords.

Planning

- Formulates a search strategy.
- Identifies potential information sources.
- Creates a general framework for organizing information found.
- Identifies potential formats for presenting results.

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During Stage

Exploration

- Uses indexes and search engines.
- Locates and accesses information resources.
- Explores range of information resources.
- Rethinks research topic.
- Finalizes formulation of research topic.

Collection

- Selects most appropriate information sources.
- Skims/scans information sources.
- Locates relevant information within selected sources.
- Identifies and extracts relevant information from selected sources.
- Uses highlighting and/or note-taking skills.
- Evaluates quality of information and information source.
- Recognizes when sufficient information has been obtained.
- Stores information for potential future use.

Organization

- Analyzes quality of information.
- Filters out irrelevant information.
- Summarizes/synthesizes/classifies final information.
- Sequences final information.
- Organizes final information for presentation

Ending Stage

Presentation

- Selects most appropriate format for communicating results.
- Assembles organized information for presentation.
- Reviews presentation for grammatical, spelling, and other errors.
- Cites sources appropriately.
- Presents results.

Evaluation

- Evaluates end product.
- Assesses the efficiency of the research process.
- Determines ways to improve future research process and results.
- Determines future usefulness/applicability of research process.

The Power of Motivation

Through her landmark longitudinal research in which she observed students as they completed a research task, Kuhlthau (e.g., 1991, 1993) identified not only the cognitive strategies students used but also the affective feelings that students experienced at various stages in the research process. For example, she found that during the Beginning and During Stages, when students try to identify a research topic and again as they begin to explore and collect information on their topic from information sources, they often experience feelings of anxiety, uncertainty and information overload and are more likely to become discouraged and demonstrate low confidence. She reports that it is not until about midway through the process that students begin to resolve this uncertainty, formulate a more precise research topic and search strategy, and feel more confident and self-determining.

In a study exploring the motivational strategies used by school library media specialists when teaching information literacy skills to students, Small (1999) used the ARCS Model to analyze and describe her findings. She found that while library media specialists incorporated many motivational strategies into their instruction, the majority of those strategies were Attention strategies, with very few Relevance, Confidence, and Satisfaction strategies. Kuhlthau's work, however, indicates a need to emphasize Relevance and Confidence strategies at certain

critical points as students proceed through the research process. While current information literacy models do a good job of defining the appropriate concepts and skills to be taught (i.e., describing *what* to teach), they all lack a systematic approach for applying motivational principles to the design of information literacy skills instruction (i.e., prescribing *how* to teach in a way that stimulates intellectual curiosity, encourages continued information seeking, and promotes a desire for lifelong learning and exploration). To help fill this gap, we have developed a way to enhance existing information literacy models with an *overlay* of motivational techniques and strategies.

The Motivation Overlay for Information Skills Instruction (Small & Arnone, 2000) integrates several theories and models in information science and motivation, especially the work of Kuhlthau (e.g., 1993) and Keller (e.g. 1987) to present a framework for designing motivating information literacy skills instruction (see Fig. 2). It is called an overlay because it is meant to be superimposed on any existing information skills model in order to guide the creation or selection of motivational techniques for information skills lessons.

The Motivation Overlay for Information Literacy Instruction promotes an *information motivation* perspective that excites students about information exploration and knowledge discovery and encourages self-determination and self-efficacy in the development of information literacy competence for lifelong learning. "The Motivation Overlay prescribes an SOS (situation-outcomes-strategies) framework for creating challenging, student-centered, information-rich learning environments that (1) take into account the motivational *situation*, including the incoming motivational profile (attitudes and motives) of students, (2) target desired motivational *outcomes*, and (3) suggest broad motivational techniques and specific *strategies* to engage learners in and excite them about the process of constructing meaningful knowledge and developing skills in order to solve authentic information problems" (Small & Arnone, 2000, p. 23).

The Motivation Overlay for Information Skills Instruction specifies motivational goals to guide the design of information literacy skills instruction and selection of motivational techniques and strategies for each of the research stages. Motivational goals differ from instructional goals in that the former describe general feelings, attitudes, and motives to be achieved during instruction while the latter are broad statements to describe the intended learning results of that instruction. Specification of motivational goals is a necessary prerequisite to the selection (and later evaluation) of effective motivational techniques.

Based on what we know from Kuhlthau's research, at the beginning of the research process when students are required to define their research task, select and narrow their research topic, and plan their research strategy, motivational goals should lead to an instructional design that (1) generates student interest in the research process; (2) helps students recognize the importance of learning information literacy skills; and (3) builds students' confidence in their ability to successfully conduct research tasks. During the research process, as students explore, gather, and organize information, motivational goals should focus on (1) maintaining students' interest in the research process; (2) promoting continued valuing of learning information literacy skills; and (3) reinforcing students' confidence in their research ability. As students proceed through the concluding stage of the process in which their research results must be presented and evaluated, motivational goals should emphasize (1) encouraging students' ongoing confidence in their research ability; (2) promoting students' satisfaction in their research accomplishments; and (3) motivating students' continuing information exploration. The underlying motivation theories for each of these stages are also specified. (For a complete description of these theories and their relation to the Motivation Overlay for Information Skills Instruction, see Small & Arnone, 2000).

Research Stages	**BEGINNING**	**DURING**	**ENDING**
Infor mation Skills	Definition Selection Planning	Exploration Collection Organization	Presentation Evaluation
Motivational Goals	Generate interest in the research process. Establish importance of information skills. Build confidence in research ability.	Maintain interest in the research process. Promote value of information skills. Reinforce confidence in research ability.	Encourage ongoing confidence in research ability. Promote satisfaction in research accomplishments. Motivate continuing information exploration.
Related Motivational Theories	Expectancy-value Need	Expectancy-value Need	Expectancy-value Attribution

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	Curiosity Attribution Social learning	Flow Attribution Social learning	Curiosity Social learning

Fig. 2. The Motivation Overlay for Information Skills Instruction

Each of the motivational goals may then be used to guide the design of a "Motivation Toolkit," a set of motivational techniques and strategies for accomplishing a particular goal. One technique and an example strategy for each of the research stages is presented in Figure 3. (For complete toolkits for all three research stages, see Small & Arnone, 2000, pp. 66, 109, and 146).

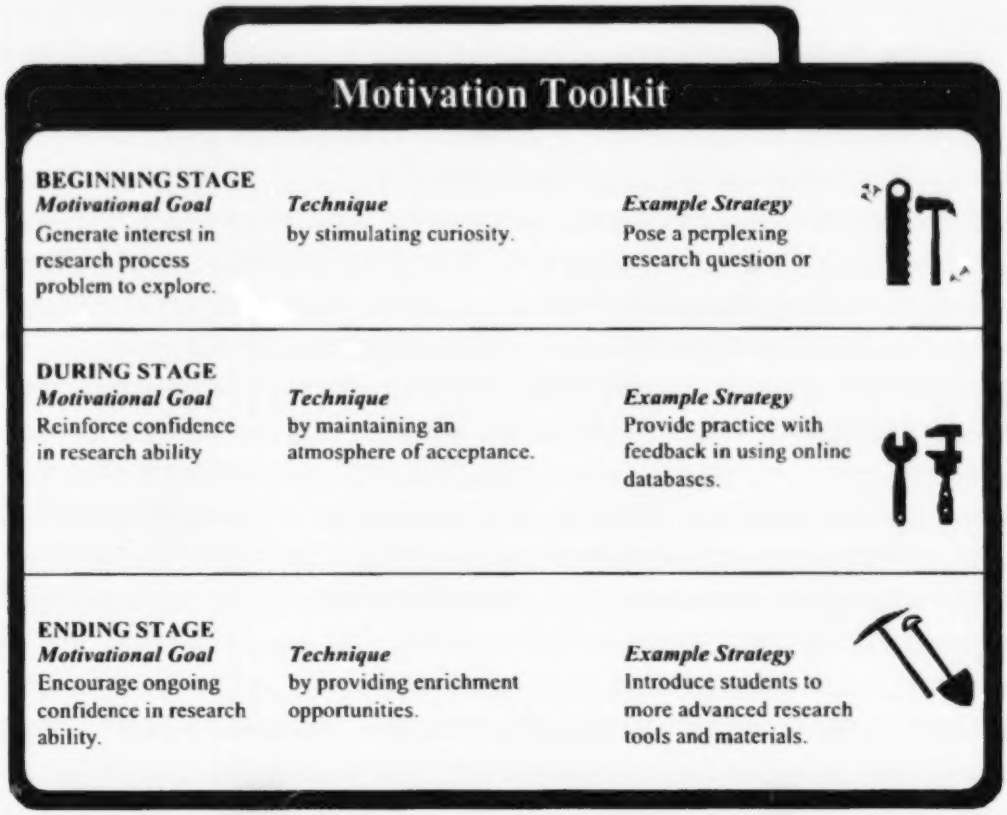

Fig. 3. Example of a Motivation Toolkit (adapted from Moyer & Small, 2001).

Each Motivation Toolkit can be customized to meet the motivational needs of a particular lesson. In addition, each Toolkit can be expanded and updated over time. The creation and use of Motivation Toolkits will enhance the teaching and learning of information literacy skills for all students.

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